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FIG. 1

OUTPUT DATA OF
SYSTEM DECODER

1	/////	3	4	5

412   432 442 452

~206

UNIQUE WORD

8051

ERROR AND END OF ERROR
INTERVAL DETECTABLE
EXAMPLE) "0x000001A1"
"0x000001A4000000000001A5"

FIG. 2

PORTABLE TELEPHONE

~201

203

WIRELESS
INTERFACE
UNIT

202

SYSTEM
DECODER

~205

204   206~

207~ MEMORY

208

209

APPLICATION
DECODER

~200

FIG. 3

| 411 | 412 | | 421 | 422 | | 431 | 432 | | 441 | 442 | | 451 | 452 |

(Figure showing five boxes labeled 1, 2, 3, 4, 5 with reference numbers 411/412, 421/422, 431/432, 441/442, 451/452)

FIG. 4

(Figure showing boxes labeled 1, 2, 3, 4, 5 — 2060, with reference numbers 412, 422, 432, 442, 452)

FIG. 5

(Figure showing boxes labeled 1, 3, 4, 5 — 2061, with reference numbers 412, 432, 442, 452)

FIG. 6

FIG. 7(a)

FIG. 7(b)

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FIG. 8

802 — PACKET LOSS
DETECTION UNIT

MEDIA DATA
RECONSTRUCTION
UNIT — 308

— 801

— 307

913 — RTP ANALYSIS
UNIT — 301

9121

302

RETRANSMISSION
JUDGMENT UNIT

TCP ANALYSIS
UNIT

UDP ANALYSIS
UNIT

304

910

9080

9081

911

IP ANALYSIS UNIT — 907

9061

PPP ANALYSIS UNIT — 905

9041

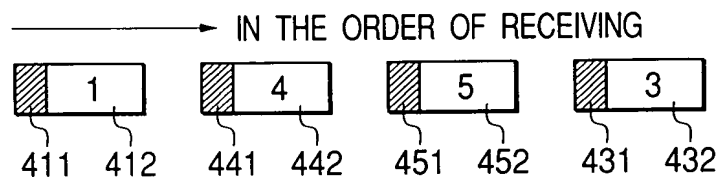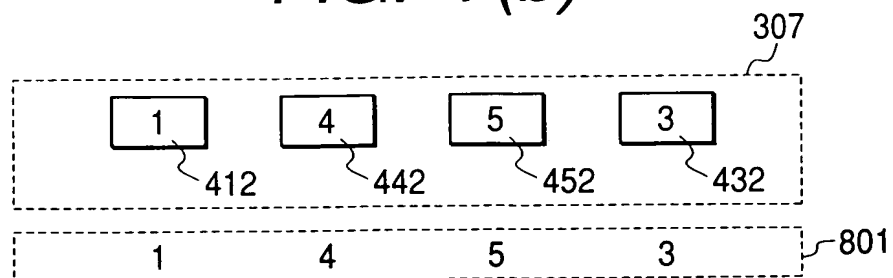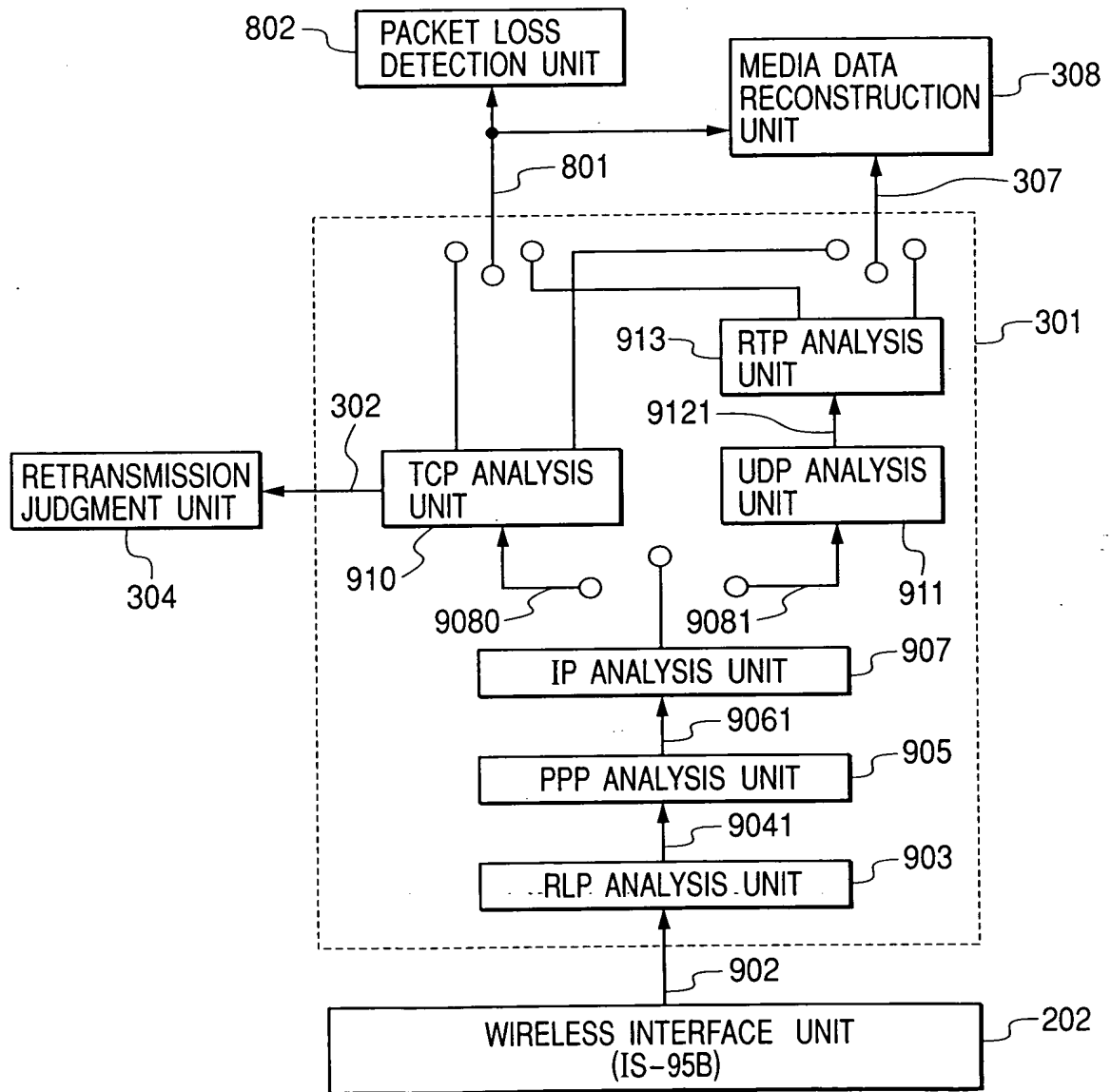RLP ANALYSIS UNIT — 903

902

WIRELESS INTERFACE UNIT
(IS-95B) — 202

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FIG. 9

IPv4 PACKET

VERSION (4 BITS)	HEADER LENGTH (4 BITS)	PRIORITY (3 BITS)	SERVICE TYPE (5 BITS)	TOTAL IP LENGTH (2 BYTES)
DATAGRAM ID (2 BYTES)	FRAGMENT (2 BYTES)	TIME TO LIVE (TTL) (1 BYTE)	PROTOCOL (1 BYTE)	CHECKSUM (2 BYTES)
SOURCE PORT ADDRESS (4 BYTES)	DESTINATION PORT ADDRESS (4 BYTES)	PAYLOAD (VARIABLE LENGTH)		

9061

908

FIG. 10

9041

PPP FRAME

FLAG (1 BYTE)	DESTINATION PORT ADDRESS (1 BYTE)	CONTROL (1 BYTE)	PROTOCOL (2 BYTES)	PAYLOAD (VARIABLE LENGTH)	CYCLIC REDUNDANCY CHECK (2 BYTES)	FLAG (1 BYTE)

906

FIG. 11

902

RLP FRAME

SEQUENCE NUMBER (1 BYTE)	TYPE OF FRAME (1 BIT)	PAYLOAD LENGTH (7 BITS)	PAYLOAD (VARIABLE)	PADDING (VARIABLE)

904

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FIG. 12

TCP PACKET

SOURCE PORT (2 BYTES)	DESTINATION PORT (2 BYTES)	SOURCE PORT SEQUENCE NUMBER (4 BYTES)	ACKNOWLEDGMENT SEQUENCE NUMBER (4 BYTES)		
HEADER LENGTH (4 BITS)	RESERVED (4 BITS)	SESSION FLAG (1 BYTE)	WINDOW SIZE (2 BYTES)	CHECKSUM (2 BYTES)	URGENT POINTER (2 BYTES)
PAYLOAD (VARIABLE LENGTH)					

801 9080

307

FIG. 13

UDP PACKET

SOURCE PORT (2 BYTES)	DESTINATION PORT (2 BYTES)	UDP PACKET LENGTH (2 BYTES)	CHECKSUM (2 BYTES)	PAYLOAD (VARIABLE LENGTH)

9081

912

FIG. 14

RTP PACKET

VERSION (2 BITS)	PADDING (1 BIT)	EXTENSION (1 BIT)	CONTRIBUTING SOURCE NUMBER (4 BITS)	MARKER (1 BIT)	PAYLOAD TYPE (7 BITS)
SEQUENCE NUMBER (2 BYTES)	TIME-STAMP (4 BYTES)	SYNCHRONIZATION SOURCE ID (4 BYTES)	RSRC LIST (4 BYTES×15, MAX)		PAYLOAD (VARIABLE LENGTH)

9121 801

801 801 307

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FIG. 15

OUTPUT DATA OF
SYSTEM DECODER

| 1 | ▨ | 3 | 4 | 5 | ⌐206 |

412   432   442   452

"0x00000000"   DATA STRING NOT FOUND IN
                     MEDIA DECODER STANDARD

8052

FIG. 16

OUTPUT DATA OF SYSTEM DECODER

MEDIA DATA   8053

| 1 | ▨ | 3 | 4 | 5 | ⌐206 |

412   432   442   452

INSERT "00" FOR AS MANY
BYTES AS DESIRED

ERROR INDICATION DATA

| | ⣿ | | | | ⌐706 |

SYNTHESIZE "ff"   SYNTHESIZE "0"
AS MUCH AS   AS MUCH AS
DATA AMOUNT   DATA AMOUNT

FIG. 17

PORTABLE TELEPHONE

WIRELESS INTERFACE UNIT 202

SYSTEM DECODER 205

MEMORY 207

APPLICATION DECODER 209

201
203
204
706
206
208
703
2002

FIG. 18

PORTABLE TELEPHONE

WIRELESS INTERFACE UNIT 202

SYSTEM DECODER 205

APPLICATION DECODER 209

MEMORY 207

MEMORY

ERROR OR RESYNC MARKER DETECTION 701

DATA CORRECTION PROCESS 707

201
203
204
206
706
208
705
710
711
208
703
704
713
712
709
708
703

FIG. 19

FIG. 20

FIG. 21

vo_start_code
(32bit-unique word)

gov_start_code
(32bit-unique word, optional)

1800

| VOS HEADER | VO HEADER | VOL HEADER | GOV HEADER | VOP | VOP | ... | GOV HEADER | VOP | ... | VOS HEADER | ... | End code of VOS |

vos_start_code
(32bit-unique word)

vol_start_code
(32bit-unique word)

vos_end_code
(32bit-unique word)

FIG. 22

1900

vop_start_code (32bit-unique word)	vop_coding_type (2bit)		modulo_time_base (1bit AND ABOVE, TERMINATE WITH "0")		marker_bit (1bit)
vop_time_increment (1-16bit VARIABLE)	marker bit (1bit)	vop_coded (1bit)	vop_rounding_type (IN CASE OF 1bit, vop_coding_type !="1")		
intra_dc_vlc_thr (3bit)	vop_quant (5bit)	vop_fcode_forward (IN CASE OF 3bit, vop_coding_type !="1")		vop_fcode_backward(IN CASE OF 3bit, vop_coding_type=="B")	

FIG. 23

Y SIGNAL

2001

Cr SIGNAL

2002

Cb SIGNAL

2003

FIG. 24

2101

| 2101-1 | 2101-2 |
| 2101-3 | 2101-4 |

Y SIGNAl BLOCK

2102

Cr SIGNAL BLOCK

2103

Cb SIGNAL BLOCK
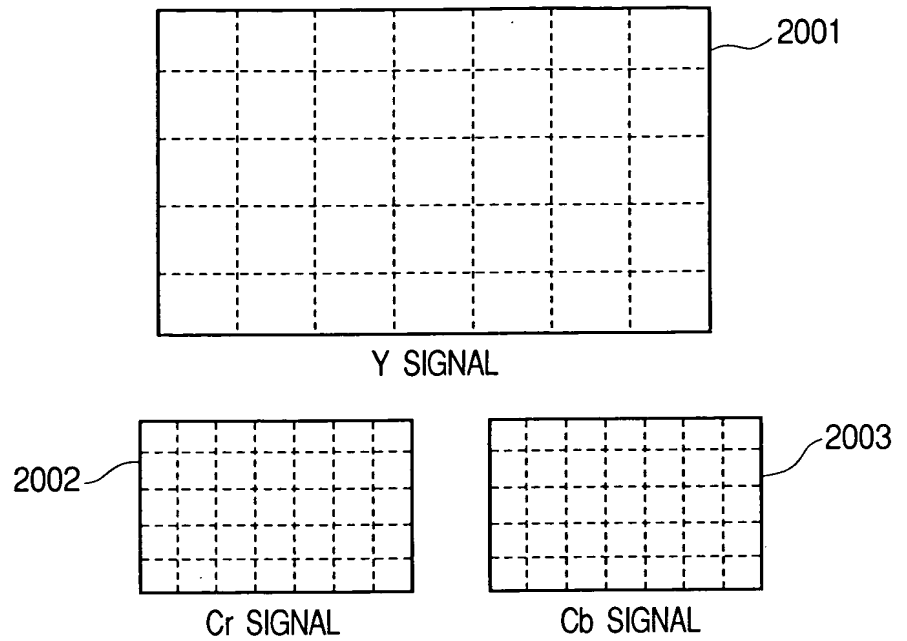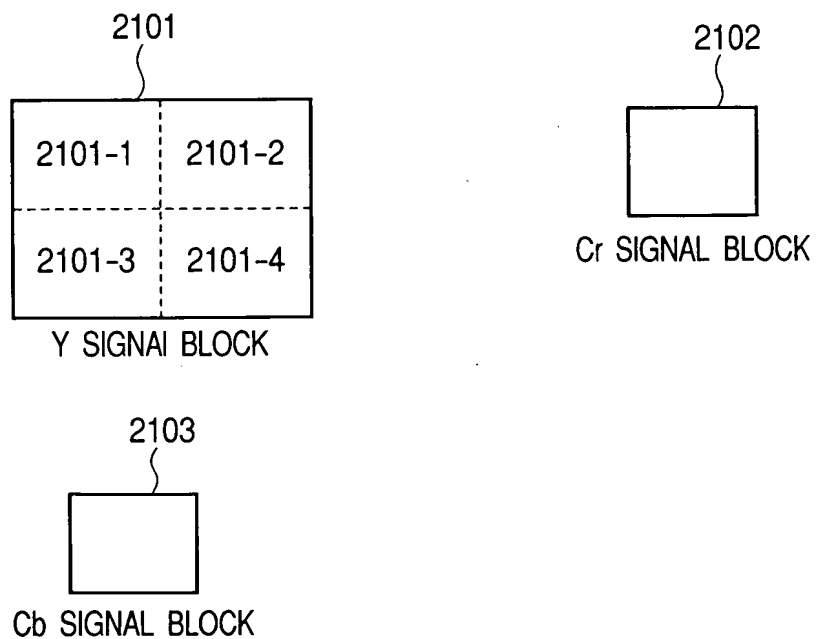
FIG. 25

2200

not_coded (1bit, vop_coding _type==IN CASE OF "p")	mcbpc (1-9bit VARIABLE)	ac_pred_flag (1bit, mb_type== IN CASE OF intra or intra+q)
cpby (1-6bit, mb_type != IN CASE OF stuffing)	dquant (2bit, mb_type ==IN CASE OF intra+q or inter+q)	MOTION VECTOR (mb_type ==inter, inter+q or inter4v)
DIFFERENTIAL intra DC COEFFICIENT (mb_type==intra or intra+q AND use _intra_dc_vlc==IN CASE OF "1")	Intra AC COEFFICIENT or inter DC & AC COEFFICIENT (BLOCK DESIGNATED BY cbpy, cbpci)	

mcbpc : mb_type (intra, intra+q, inter, inter+q, inter4v, stuffing), cbpc
not_coded : IN CASE OF "1", mb_type=inter, NO MOTION, mcbpc
AND THEREAFTER OMITTED
use_intra_dc_vlc : DETERMINE BY quant AND intra_dc_vlc_thr,
AND TAKE THE VALUE OF "0" OR "1"

FIG. 26

2301

2302

2001
2303
2304
2305

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FIG. 27

VIDEO PACKET DATA (I-VOP)

VIDEO PACKET HEADER	PRIORITY DATA PART (I-VOP)	dc_marker (19bit)	AC COEFFICIENT CONTROL INFORMATION (ac_pred_flag, cbpy)	AC COEFFICIENT INFORMATION
2401	2402	2403	2404	2405

FIG. 28

2401

resync_marker (17-23bit-unique word)	macroblock_number (1-14bit)	quant_scale (5bit)	header_extension_code (1bit)	
modulo_time_base (1bit AND ABOVE, TERMINATE WITH "0")	marker_bit (1bit)	vop_time_increment (1-16bit VARIABLE)	marker_bit (1bit)	vop_coding_type (2bit)
intra_dc_vlc_thr (3bit)	vop_fcode_forward (IN CASE OF 3bit, vop_coding_type !="1")		vop_fcode_backward (IN CASE OF 3bit, vop_coding_type =="B")	

FIG. 29

24021

PRIORITY DATA PART (I-VOP)

mcbpc (1-9bit VARIABLE)	dquant (IN CASE OF 2bit, mb_type==intra+q)	DIFFERENTIAL intra DC COEFFICIENT (IN CASE OF use_intra_dc_vlc=="1")

mcbpc : mb_type (intra, intra+q stuffing), cbpc
use_intra_dc_vlc : DETERMINE BY quant AND intra_dc_vlc_thr,
AND TAKE THE VALUE OF "0" OR "1"

FIG. 30

AC COEFFICIENT
CONTROL INFORMATION

ac_pred_flag (1bit)	cbpy (1-6bit)

~24041

FIG. 31

AC COEFFICIENT
INFORMATION

AC COEFFICIENT (BLOCK DESIGNATED BY cbpy, cbpci)

~24051

FIG. 32

VIDEO PACKET DATA (P-VOP)

VIDEO PACKET HEADER	PRIORITY DATA PART (P-VOP)	motion_marker (17bit)	intra DIFFERENTIAL DC COEFFICIENT INFORMATION & AC COEFFICIENT CONTROL INFORMATION (IN CASE OF not_coded=="0")	intra AC COEFFICIENT or inter DC & AC COEFFICIENT INFORMATION (IN CASE OF not_coded=="0")
2401	2902	2903	2904	2905

FIG. 33

PRIORITY DATA PART (P-VOP)

29021

not_coded (1bit)	mcbpc (1-9bit VARIABLE)	MOTION VECTOR (mb_type==inter, inter+q, or inter4v)

mcbpc : mb_type (intra, intra+q, inter, inter+q, inter4v, stuffing), cbpc
IN CASE OF not_coded : "1", mb_type=inter, NO MOTION, mcbpc
AND THEREAFTER OMITTED

FIG. 34

intra DIFFERENTIAL DC COEFFICIENT
INFORMATION & AC COEFFICIENT
CONTROL INFORMATION

29041

ac_pred_flag (IN CASE OF 1bit, mb_type==intra or intra+q)	cbpy (1-6bit)	dquant (IN CASE OF 2bit, mb_type==intra+q or inter+q)
DIFFERENTIAL intra DC COEFFICIENT (mb_type==intra or intra+q)		

FIG. 35

intra AC COEFFICIENT or inter
DC & AC COEFFICIENT
INFORMATION

intra AC COEFFICIENT or inter DC & AC COEFFICIENT (BLOCK DESIGNATED BY cbpy, cbpci

29051

FIG. 36

713

707

208

3301 RESYNC MARKER ? —YES→ TRANSFER DATA UP TO RESYNC MARKER TO SECOND MEMORY 3313

NO

3302 REQUEST DATA UP TO NEXT RESYNC MARKER

3314 DISCARD DATA TO NEXT VOL HEADER. DISCARD DATA UP TO NEXT I-VOP (EXCEPT VOL HEADER)

712

3303 VOL HEADER INCLUDED ? —YES→ 3306 RETRANSMISSION VOL HEADER ? —NO→

NO — YES

3304 VOP HEADER INCLUDED ? —YES→ 3307 B-VOP ? —YES→ DISCARD DATA UP TO NEXT START CODE 3315

NO — NO

708

3305 IS MB POSITION DESTROYED ? —YES→ INVESTIGATE POSITION OF FIRST MB OF PRECEDING VP AND NUMBER OF CODED MB 3316

NO

709

3308 DETECT POSITION OF FIRST MB OF CURRENT VP

IN CASE OF (3)

3317
(1) DISCARD DATA UP TO RESYNC MARKER WITH NEXT HEADER INFORMATION OR DATA UP TO START CODE

(2) SET POSITION OF CURRENT MB TO "0"

(3) IN CASE RESYNC MARKER WITH HEADER INFORMATION IS INCLUDED IN FRAME, GENERATE VOP HEADER FROM HEADER INFORMATION

(4) IN CASE RESYNC MARKER WITH HEADER INFORMATION IS NOT INCLUDED IN FRAME, PREPARE VOP HEADER BY SETTING vop_coded TO "0".
IF VALUE OF vop_time_increment OF NEXT FRAME IS SMALLER THAN PREVIOUS FRAME, SET modulo_time_base TO "10", AND SET vop_time_increment TO "0".
IN OTHER CASES, SET module_time_base TO "0", AND SET vop_time_increment TO THAT OF PREVIOUS FRAME PLUS 1.

DETECT POSITION OF FIRST MB OF NEXT VP

3309

CORRECT MACRO BLOCK DATA

3310

IN CASE OF (4)

BYTE-ALIGN PROCESSING

3311

TRANSFER CORRECTED DATA AFTER BYTE-ALIGN TO MEMORY

3312

708

FIG. 37

3310

VP HEADER INCLUDED ? — 3401

YES →

· CONSTRUCT VP HEADER ACCORDING TO MB number
· IN CASE OF P-VOP, PERFORM PROCESSING I TO ALL MBs IN PACKET, AND ADD motion_marker
· IN CASE OF I-VOP, PERFORM PROCESSING II TO ALL MBs IN PACKET, AND ADD dc_marker
· DISCARD ALL ORIGINAL DATA IN PACKET

3402

NO ↓

PRIORITY DATA UNIT INCLUDED ? — 3403

NO ←

YES ↓

DC OR MOTION MARKER INCLUDED ? — 3404

3405

YES →

· PERFORM PROCESSING II TO MB WITH NORMAL PRIORITY DATA PART CONFORMABLE TO SPEC. OF DECODER
· FOR MB NOT DECODABLE BY PRIORITY DATA PART, PERFORM PROCESSING II IF I-VOP, AND PERFORM PROCESSING I IF P-VOP
· ADD motion_marker OR dc_marker

NO ↓

3406

· STORE DATA OF NORMAL MB IN CASE BOTH PRIORITY DATA PART AND DCT DATA PART ARE CONFORMABLE TO SPEC. OF DECODER
· FOR MB NOT DECODABLE BY PRIORITY DATA PART, PERFORM PROCESSING II IF I-VOP, AND PERFORM PROCESSING I IF P-VOP
· FOR MB WITH ONLY DCT DATA PART NOT DECODABLE, PERFORM PROCESSING III
· FOR MB WITH NO PRIORITY DATA PART INFORMATION (BECAUSE TWO OR MORE VPs ARE CONNECTED), PERFORM PROCESSING II IN CASE OF I-VOP, AND PERFORM PROCESSING I IN CASE OF P-VOP

3407

· STORE DATA OF MB WITH DCT DATA PART CONFORMABLE TO SYNTAX
· FOR MB WITH DCT DATA PART NOT DECODABLE, PERFORM PROCESSING III
· FOR MB WITH NO PRIORITY DATA UNIT INFORMATION (BECAUSE TWO OR MORE VPs ARE CONNECTED), PERFORM PROCESSING II IN CASE OF I-VOP, AND PROCESSING I IN CASE OF P-VOP
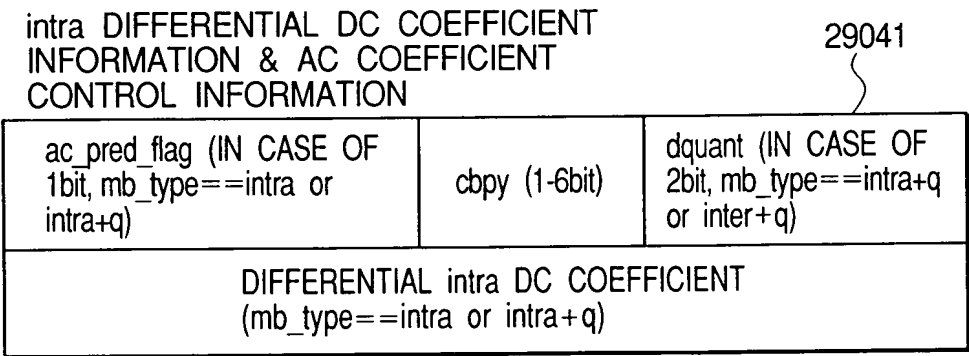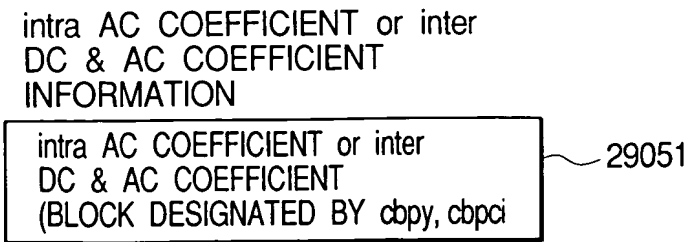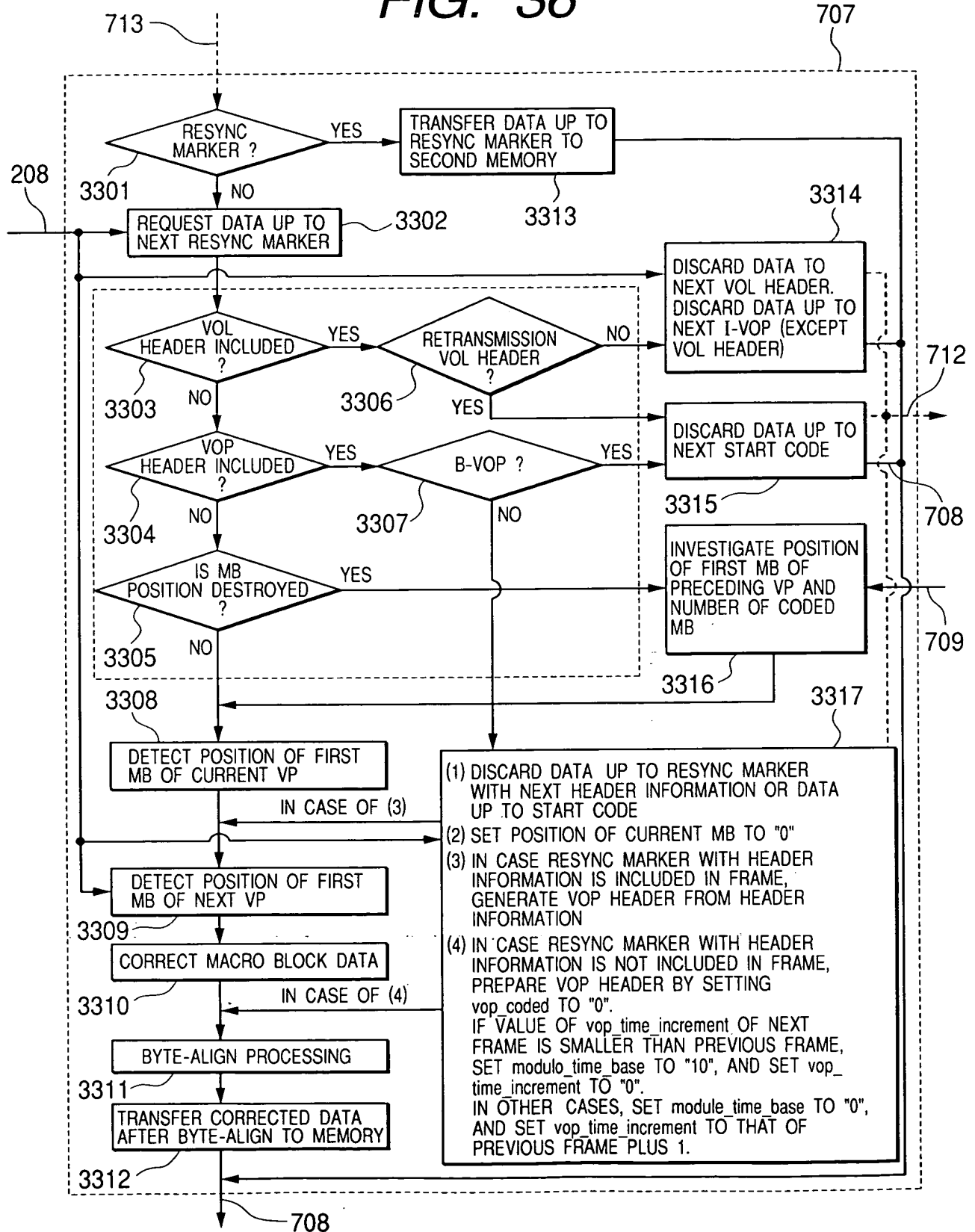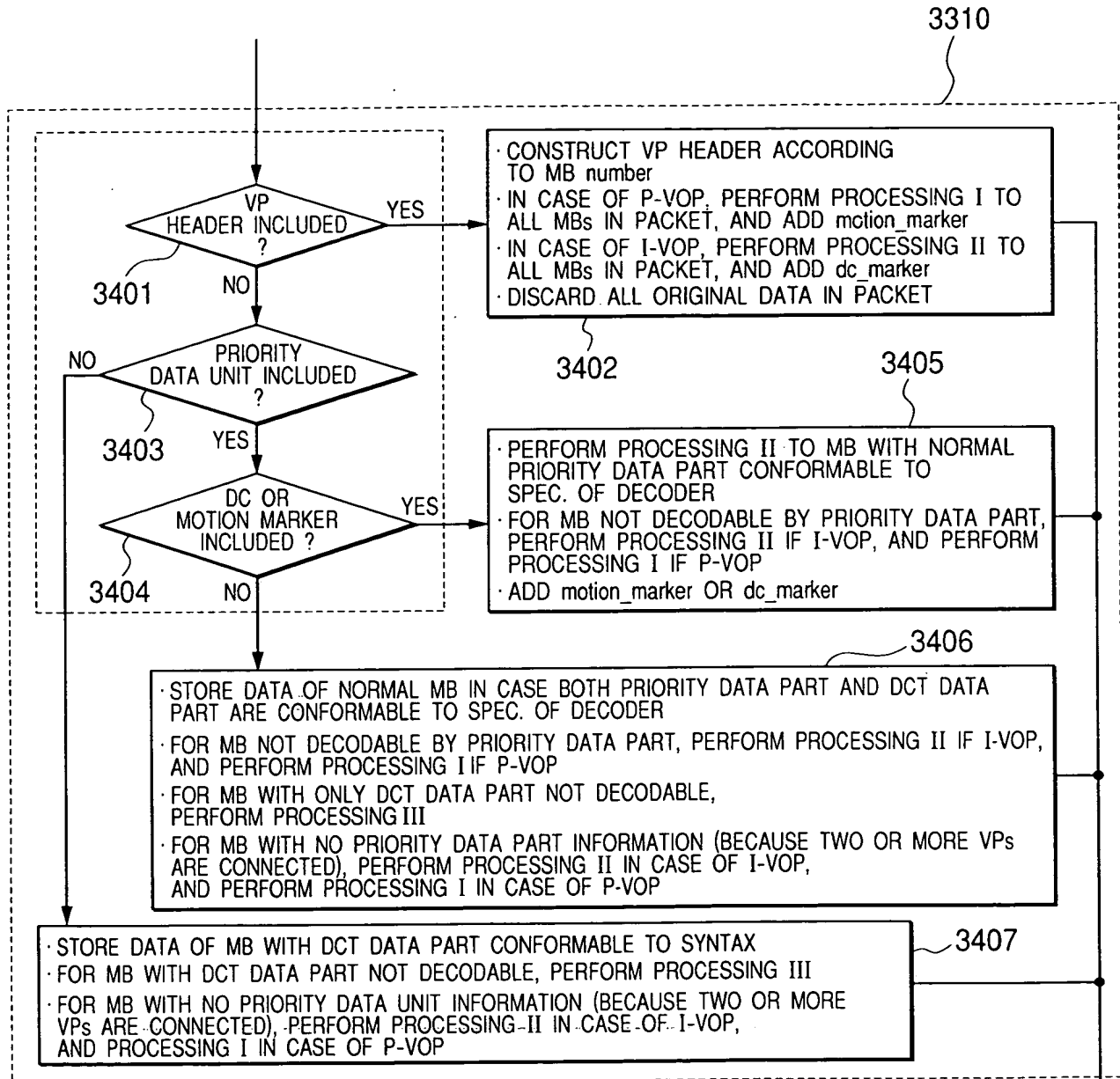
PROCESSING I : SET not_coded FLAG TO "1". DELETE ORIGINAL DATA IN MB.

PROCESSING II : SET ALL DIFFERENTIAL DC COEFFICIENTS IN MB TO "0" AND SET mb_type TO "intra"
AND SET cpby AND cbpc (mcbpc) TO NO CODED BLOCK.
DELETE ORIGINAL DATA IN MB.

PROCESSING III : SET cpby AND cbpc (mcbpc) TO NO CODED BLOCK.
FURTHER, IN CASE OF I-VOP, SET ac_pred_flag TO "0", AND DELETE AC COEFFICIENT DATA.
IN CASE OF P-VOP, PERFORM PROCESSING I IF INTRA CODING. IF mb_type
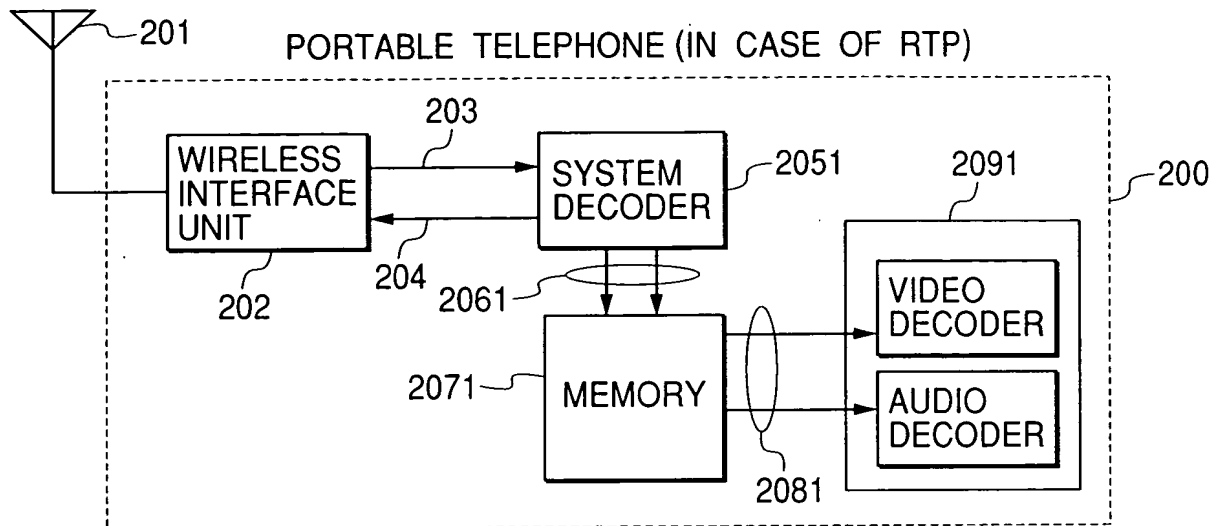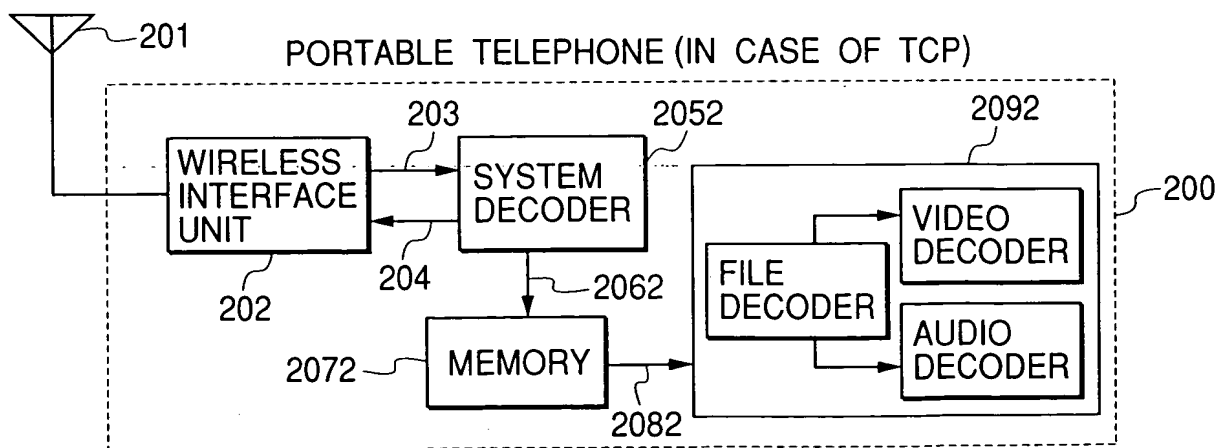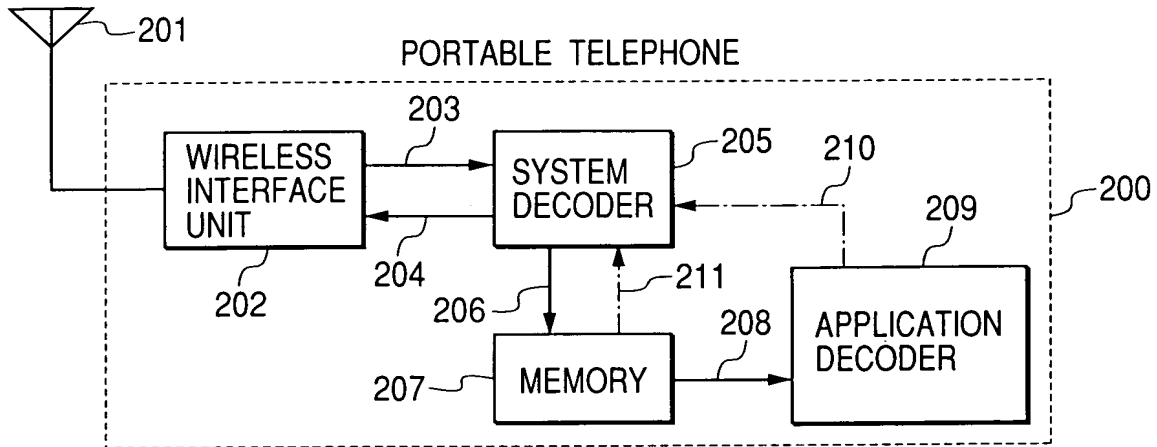IS PREDICTIVE CODING DELETE inter DC & AC COEFFICIENT DATA.

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FIG. 38

PORTABLE TELEPHONE (IN CASE OF RTP)

FIG. 39

PORTABLE TELEPHONE (IN CASE OF TCP)

FIG. 40

PORTABLE TELEPHONE

201

WIRELESS
INTERFACE
UNIT
203

202

204

SYSTEM
DECODER
205

210

200

211

206

209

APPLICATION
DECODER

207

208

MEMORY

FIG. 41

WIRELESS
INTERFACE
UNIT
202

207

MEMORY

SYSTEM DECODER

203

204

210

301

PACKET DATA
PROCESSING
UNIT

307

MEDIA DATA
RECONSTRUCTION
UNIT

206

MEDIA DATA
OUTPUT UNIT

206

304

302

801

807

802

806

808

805

804

310

706

RETRANSMISSION
JUDGMENT UNIT

PACKET LOSS
DETECTION UNIT

ERROR
INDICATION
OUTPUT UNIT

305

303

211

205

ACKNOWLEDGMENT
UNIT

306

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FIG. 42

- 802 — PACKET LOSS DETECTION UNIT
- MEDIA DATA RECONSTRUCTION UNIT — 308
- 801
- 307
- RTP ANALYSIS UNIT — 301
- 9122
- 302
- 9120
- 9121
- 913
- RETRANSMISSION JUDGMENT UNIT
- TCP ANALYSIS UNIT
- UDP ANALYSIS UNIT
- 304
- 910
- 9080
- 9081
- 911
- IP ANALYSIS UNIT — 907
- 9061
- PPP ANALYSIS UNIT — 905
- 9041
- RLP ANALYSIS UNIT — 903
- 902
- WIRELESS INTERFACE UNIT (IS-95B) — 202

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FIG. 43

PORTABLE TELEPHONE (IN CASE OF RTP)

FIG. 44

PORTABLE TELEPHONE (IN CASE OF TCP)